



Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at <http://about.jstor.org/participate-jstor/individuals/early-journal-content>.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact support@jstor.org.

PHILOSOPHICAL TRANSACTIONS.

For the Months of November and December, 1695.

The CONTENTS.

I. **P**ropositio Generalis Arearum dimensionem exhibens in universo illo Curvarum Genere, quæ revolutione æquali Circuli super Basin quamvis, vel rectilineam vel Circularem describi possint; nempe omnium Cycloidum vel Epicycloidum, quovis modo genitarum. Cum Demonstratione Quadraturæ portionis Epicycloidis à Domino Caswell inventæ, (Numb. 217. p. 114. promissâ) per E. Halley. II. An Extract of the Journals of two several Voyages of the English Merchants of the Factory of Aleppo, to Tadmor, anciently call'd Palmyra. III. Some Account of the ancient State of the City of Palmyra, with some short Remarks on the Inscriptions found there: With an Observation of the Latitude of Aleppo, and the ascertaining of the Geographical Site of the Ancient Araçta, and several Cities in Syria. By E. Halley.

I. Propositio Generalis Arearum dimensionem exhibens in universo illo Curvarum Genere quæ revolutione æquali Circuli super Basin quamvis vel rectilineam vel Circularem describi possint, &c.

Notum est Cycloidem primariam, sicut etiam Prolatam ac Contractam (quas Trochoides vocant) à Celeberrimo Wallisio aliisque uberrime tractatas fuisse; earumque proprietates dudum innotuisse: ut jam vix liceat quicquam novi de iis
X
comminisci.

gantur, concipe areolam $QSMN$ constare ex tribus sectoribus RMS , RMQ , MQN ; adeoque areolam RMS esse ad Areolam $QSMN$, ut est angulus RMS ad summam trium angulorum $RMS + RMQ + MQN$. At anguli $RMQ + MQN$ æquantur angulis $MCN + MKN$, sive angulo cMC ; propter lineas RM , QN , invicem inclinatis sub angulo ipsi MKN æquali, ac propter angulum MQN ipsius MCN dimidium (per *Euch.* 3. 20.) Proinde angulus RMS est ad angulos $RMS + cMC$, hoc est, (per eandem 3. 20.) arcus $\frac{1}{2}RS$ ad duos arcus $Cc + \frac{1}{2}RS$, sive RS ad $2Cc + RS$; ut areola RSQ , ad areolam $QSMN$: sive ut momentum segmenti circularis QTN ad momentum segmenti in Epicycloide simul geniti $QSYMN$. Cumque hæc momenta semper sint in eadem illa ratione, ubicunque assumptis punctum Q , constat Areas ipsas QTN , $QSYMN$ his momentis genitas, eandem constantem habere rationem, nempe velocitatis motus circularis RS , ad duplam velocitatem centri addito motu circulari, sive $2Cc + RS$. Sicut etiam Aream $V B Z$ ad Aream $Q V B N$, ac proinde semicirculum $V L B$ ad spatium Curvilineum $V Q Y N B$. Ergo constas

Propositio. Nulla autem alia est differentia in modo demonstrandi, si circulus genitor super arcu Basis Concavæ moveatur, nisi quod angulus cMC , hoc in casu, sit differentia angulorum MCN , MKN . Si vero Basis sit linea recta, evanescente MKN , ac ob RM , QN parallelas, etiam facilius erit probatio. Deducendis ex hac propositione Corollariis, cum in promptu sint, libenter abstineo: In omnibus autem hujusmodi Curvis portiones analogæ portionibus illis, quas in Cycloide primariâ perfectæ Quadraturæ capaces invenit Cl. Wallisius, sunt æque quadrabiles, quod quidem facile consequitur ex præmissis.

Centro K , per punctum Q duc circulem arcum QZ , ac age ZB abscindens segmentum ZLB æquale segmento QTN , Dein biseca semicirculum $V B$ in L , ac per punctum L , centro etiam K , describe arcum PL , secantem Epicycloidem in P , circulum Genitorem in T , ac Chordas QN , ZB in y & X . Jam sit Arcus $VZ = a$, ejusque sinus $= s$, Radius Genitoris $= r$, Radius vero Basis $= R$; sitque arcus CE sive motus centri $= m$. Patet sectorem CKE eam rationem habere ad spatium $XYNB$, quam habet quadratum ex KE , ad differentiam quadratorum ex KL & KB ; sive ut $RR + 2Rr + rr$

ad

ad $2Rr + 2rr$; hoc est ut $R + r$ ad $2r$, vel KE ad BV ; ac proinde rectangulum BE in CE sive rm æquari spatio $XyNB$. Spatium vero VZB æquale est rectang. $\frac{1}{2}ar + \frac{1}{2}sr$; adeoque, juxta nostram propositionem, erit ut a ad $2m$, ita $\frac{1}{2}ar + \frac{1}{2}sr$, ad $\frac{mar + msr}{a}$, æquale Spatio Curvilineo $QVZLBNQ$: Ex hoc subduc spatium $XyNB = rm$, & remanebit spatium $QVZXy = \frac{mrs}{a}$: Cumque spatia ZXL , QyT æquantur inter se, spatium $QVLTQ$ etiam æquabitur ipsi $\frac{mrs}{a}$: Quoties itaque a ad m , sive motus circularis ad progressivum centri, fuerit in data ratione, dabitur etiam perfecta Quadratura spatiorum curvilineorum $QVLTQ$: Totumque spatium VPL ad Quadratum Radii BE erit in eadem ratione motuum m ad a , hoc est, in omni Epicycloide primariâ, in ratione radiorum KE ad KB , quæ est ipsa Domini *Caswelli* Propositio. Spatia autem minora $QVLTQ$ erunt inter se ut Sinus Arcuum VZ ; ac spatia Triangularia QTP eodem argumento erunt ut Sinus Versi arcuum QT vel ZL : ac proinde etiam Quadrantur. Pari modo probabuntur spatia $p\Delta r$, pLu , $p\lambda r$ semper esse ad Radii BE quadratum (in omnibus his figuris) in prædicta ratione m ad a ; eorumque portiones pqt , ut Sinus Versi arcuum interceptorum qt . Residua autem segmenta, ut $qt\tau\Delta$, $qt\tau\lambda$, &c. erunt ut Sinus recti complimentorum eorundem arcuum qt .

Componitur autem ratio velocitatum m ad a , ex ratione radiorum KE , BE , ac ratione angulorum simul æqualiter descriptorum CKE , VEZ : ac proinde datâ etiam illâ angulorum ratione, etiam Quadrabuntur spatia omnia Epicycloidalia prædicta.

Omnibus his Curvis Tangentes ducere in promptu est, earumque Longitudines sive Rectificationes, ex Arcis quibusdam ipsis analogis, jam invenisse mihi videor: cujus rei occasione Familia hæc Curvarum uberius aliquando forsan tractabitur.